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Performance evaluation of institutional e-learning implementation process : strategy perspectives for effective integration in technical institutions in Africa

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PERFORMANCE EVALUATION OF INSTITUTIONAL E-LEARNING IMPLEMENTATION PROCESS: STRATEGY PERSPECTIVES FOR EFFECTIVE INTEGRATION IN TECHNICAL INSTITUTIONS IN AFRICA

Introduction

Advancements in telecommunications and information technology have over the last two decades caused higher education institutions to rethink their traditional notion of education. Computer networks now enable people in different geographical locations to communicate, stay informed and educate themselves. The affordances created by information and communication technologies, coupled with increasing demands for flexibility and convenience in learning, life-long learning and ubiquity in learning has generated extensive research into how information technology could be effectively integrated with teaching and learning. The implementation of e-learning requires a strategic approach due to the choices that have to be made at each stage of the implementation process. These choices are constrained by resource, technical, pedagogical and individual (instructors and students) factors.

Performance evaluations of institutional e-learning efforts have traditionally focused on the learning experiences of students (Dali, 2008) rather than the entire

process of implementation. It is however arguable that the actual learning outcomes for students is highly dependent on the institution's approach to introducing and implementing the e-learning system. A holistic evaluation of the e-learning implementation from how it was adopted to its implementation and integration can provide valuable insights for ensuring effective implementation and harnessing of the strengths of e-learning.

1. Review of literature

1.1. E-Learning Implementation Process

The implementation of e-learning in higher education institutions has been widely reported in literature. These reports often describe the activities that were undertaken, the challenges encountered and surmounted, successes achieved and future directions. Very clearly, they describe the implementation effort as a process and show how the various activities were managed to facilitate e-learning development. Some of these reports advocate that the implementation of e-learning connotes change in institutional practices, particularly in teaching and learning. Lessons from organisational change and development in the organisational theory literature have shown that changes to traditional organisational practices are often not welcomed and at times fiercely resisted. Evidence from the e-learning literature has shown similar conflicts among top management and stakeholders, especially by the instructors.

Traditionally, HEIs have been developed around the classroom model of instruction. Instructors with varied research experiences and knowledge present information to students. The main pedagogical model here has students passively listening to an expert without much active involvement. The academic curriculum, support structures, etc are all intricately woven around this traditional model of HEIs, making any change in such a rigid system difficult.

There are certain drivers however which necessitates the need for change in the way HEIs traditionally function. Firstly, the increasing number of students enrolled each year places tremendous stress on both teaching and physical infrastructures and resources. This often results in large numbers of qualified students being refused admission. Also, the large student-lecturer ratio coupled with the absence of quality and adequate tutorials often reduces the effectiveness of the learning process. This necessitates the need for a more effective system that adequately caters for the professional ambitions and learning aspirations of students. Secondly, in relation to the first point, there has been an increase in the cost of higher education making traditional rendering of educational services relatively cost ineffective. Thirdly, the widespread adoption of technology enhanced education and the avail-

ability of Virtual Learning Environments have caused some traditional universities to over physical barriers to education. Now many universities offer educational services across national boundaries, taking advantage of existing large numbers of potential students. These factors enumerated above represent some of the main drivers for change in HEIs.

The emergence of e-learning proved particularly beneficial even though it was apparently overhyped. This hype may have contributed to the resistance by many instructors in the 1990s especially as there was an unfavourable notion that e-learning would take over traditional classroom learning. Essentially e-learning can be construed as a teaching and learning tool that brings in its wake changes in the way traditional practices within an educational institution are conducted. That notwithstanding, there have been many successful e-learning implementation projects in many HEIs around the world as well as many failures.

There have been various perspectives on the implementation of e-learning in HEIs. Notable among them are the systems perspectives (Cech & Bures, 2004), innovation diffusion perspectives (Singh, 2010) and change perspectives (Schönwald, 2003). Cech & Bures (2004) posited that the steps specifically prepared for e-learning projects are based on the systems approach. They maintained that the systems approach focused on the important elements and relationships and neglects the ones that have little impact on the proposed system. They asserted that while there were numerous methodologies, most of them were built on the generic ADDIE model composed of five stages – Analysis, Design, Development, Implementation and Design. Though suitable for successful implementation of the technology itself, it does not adequately resolve issues of change in the institution as a social system. Singh (2010) argues for the widespread use of e-learning using innovation diffusion strategies which although can get many users involved, the change issues that need to be managed will not be adequately integrated. Schönwald (2003) posited that a change management approach was the best solution for a sustainable e-learning implementation in HEIs.

Although many of these research findings report e-learning implementation as a process, a clearer understanding of the underlying process in relation to the changes believed to occur during the implementation is still conspicuously missing in the literature. Cech & Bures (2004) posited that e-learning as a process encompasses other sub-processes. Studying the nature of the processes involved in e-learning implementation is therefore critical to our understanding of an effective e-learning implementation process. To better understand e-learning implementation from a change perspective, we briefly review some theoretical models from the organisational change and development literature and extant information system (IS) implementation literature

Kwon and Zmud (1987) described a six-phase process of organizational IT implementation. In their model, IT implementation was viewed as a social change

process aimed at enhancing the use of IT within targeted user communities. The implementation process included: an initiation phase which involves an environmental scanning for potential solutions; an adoption phase consisting of the examination of alternative solutions to decide which solution to deploy; an adaptation phase that includes a modification of the chosen system to suit the organization's unique processes; an acceptance phase where organizational users who will use the system show signs of commitment; a usage phase where users are motivated to use the system routinely (also known as routinization); and finally, the incorporation phase (also known as infusion, or assimilation) which involves the maximization of benefits across diverse tasks.

The phases described above are sequential, suggesting that effective implementation of a phase will foster an effective implementation succeeding phases.

Viewed from a technological diffusion perspective, IT implementation is defined as an organizational effort directed toward diffusing appropriate information technology within a user community. Based on the Kwon and Zmud's (1987) stage model of IT implementation founded on Lewin's (1952) change model, a variation of their stage model, which incorporates some of the post-adoption behaviours developed by Zmud and Apple (1989), is presented below. The Initiation stage, involving an active and/or passive scanning of organizational problems/opportunities and the selection of an IT solution is undertaken. An Adoption stage which requires a rational and political negotiation to get organizational backing for implementation of the IT application. Stage three, Adaptation stage where the IT application is developed, installed, and maintained. At this stage also, organizational procedures are revised and developed with organizational members trained in the new procedures and the IT application. The Acceptance stage involves the inducement of organizational members to commit to the IT application usage. In the Routinization stage usage of the IT application is encouraged as a normal activity. At the final stage, Infusion, increased organizational effectiveness is obtained by using the IT application in a more comprehensive and integrated manner to support higher level aspects of organizational work.

In the above model, the initiation is associated with Lewin's unfreezing stage; adoption and adaptation are associated with Lewin's change stage; and acceptance, routinization, and infusion are associated with Lewin's refreezing stage.

Table 1

Three generic phases

Source of Models	Phases									
Levin/Schein (1952)	Unfreezing				Moving		Refreezing			
Kolb/Frohman (1970)	Scouting	Entry	Diagnosis	Planning	Action		Evaluation		Termination	
Kwon and Zmud (1987)	initiation				Adoption	Adaptation	Acceptance	Use		Incorporation
Cooper and Zmud (1990)	Initiation				Adoption	Adaptation	Acceptance	Routinization		Infusion

Source: own elaboration.

From the table 1 three generic phases can be distinguished. The levels of division into additional phases as in the Kolb/Frohman (1970) model can be considered as the identification of unique activities or events to be undertaken for the successful performance of any one of the three distinct phases. The generic phase identified through an analysis of the change and IS implementation models are **adoption** (decision to use e-learning- involving all stakeholders)**, implementation (post-adoption)** (physical construction or installation of the e-learning system) **and institutionalization (post-implementation)** (embedding the e-learning within the institution). Any decision to introduce e-learning into a HEI is believed to go through several processes notable among these are the initial decision to go for the specified e-learning (adoption), a construction or installation and configuration of the system for use (implementation), and embedding or routinizing the e-learning within the institution (institutionalization). The change and IS models discussed above however failed to note the possible existence of other processes within the distinct generic processes. This has often led to the complex nature of most e-learning implementations which sometimes ended up in failure. Cech & Bures (2004) contended that the development of the e-learning used in the course curriculum undergoes a unique process of its own within the institution. It is arguable therefore that most of the events/activities identified in each of the generic phases undergo their own processes within and alongside the generic ones. Table 2 shows the generic phases, the events in each phase and some factors that influence the effective outcome of each generic phase. The rest of the paper discusses findings from an empirical investigation of the nature, importance and influence of some of the factors identified to influence the successful outcome of each phase.

Table 2

Generic phases, the events in phase and some factors that influence the effective outcome of the generic phase

Generic Phase	**Events**	**Factors for successful implementation**
Adoption	Needs assessment and goal setting Stakeholder buy-in meetings ICT skills assessment and training e-learning readiness assessment e-learning policy development e-learning steering committee e-learning communication events	Management support Stakeholder involvement E-learning policy & Goal setting Communication & Advertisement ICT skills training
Post adoption	Developing e-learning framework Physical construction/installation of system e-learning content development e-learning staff training & development Infrastructural development e-learning technical support unit e-learning champions formation	Technical support E-learning skills training e-learning champions resource availability Infrastructure
Institutionalization	Establishment of e-learning quality team Integration into institutional policy and practices Integrating e-learning with teaching and learning Establishment of an online support system	Perceived management commitment Integration with curriculum Alignment with management and administrative practices Included in policy planning and strategy formulation Online support system

Source: own elaboration.

Table 3

Factors and their definition

Stages	**Factor**	**Definition**
Adoption	**Management support (MS)**	A top-down involvement of management through the commitment of resources throughout the project's lifespan.
	Stakeholder involvement (SI)	The inclusion of everyone whose role and responsibility is affected by the e-learning implementation in the decision making process
	E-learning policy and goal setting (PG)	A guiding document and clear target for the e-learning initiative
	Communication & advertisement (CA)	The provision of relevant information to the stakeholder community aimed at educating, clarifying and gaining commitment.
	e-learning drivers (ED)	An initial assessment and equipment of stakeholders with fundamental knowledge and skills in ICT

Implementation	**Technical support (TS)**	A unit trained and equipped with the necessary resources to support the e-learning development and stakeholders' use of the system.
	E-learning skills training (ST)	Specific knowledge and skills in the management and use of the e-learning system including pedagogical considerations provided to relevant stakeholders
	e-learning champions (EC)	A group of enthusiasts motivated, inspired and self directed in the use of e-learning
	Resource availability (RA)	The availability of the requisite human, technical and financial resources relevant to the e-learning project.
	Infrastructure (IF)	The ready availability of the technological infrastructure necessary for an effective take-up of e-learning.
Institutionalization	**Management commitment (MC)**	The dedication of management to the overall success of the project.
	Integration with curriculum (IC)	A clear embedding of e-learning into curriculum indicated by a detailed alignment of technology use in teaching and learning
	Alignment with management and administrative practice (AM)	A seamless alignment with the day-to-day running of the institution
	Included in policy planning and strategy formulation (SF)	e-learning statements are fully and clearly integrated into policy and strategic statements and not as isolated statements
	Online support system (OS)	A support system available online 24-hrs a day for resolving stakeholders' problems and needs regarding the use of the e-learning system.

Source: own elaboration.

1.2. Performance Evaluation

The term Performance Evaluation has been defined variously in the e-learning literature. Used extensively in organisational management to assess employees' work output, achievement and ability (Dali, 2008), Performance Evaluation is a tool that serves the needs of programme evaluation in numerous fields such as education, project management, etc. in this paper we adopt Guskey's (2000) definition of evaluation cited in Hogan (2007) as, "… a systematic process used to determine the merit or worth of a specific programme, curriculum, or strategy in a specific context". Our definition of performance evaluation in the context of e-learning implementation process is, "a systematic process used to determine the extent to which an e-learning implementation meets set standards of acceptable implementation".

There are several classifications of evaluation in the performance evaluation literature. Notable among them are FitzPatrick et al (1983) classification of evaluation into 5 major clusters cited in Attwell (2006): Objective-oriented approach,

Management-oriented approach, Consumer-oriented approach, Expertise-oriented approach and participant oriented approach. Attwell, (2006) made some modifications to these classification and added a sixth approach, Learning-oriented approach, from Van der Knapp cited in Attwell (2006). Other specific evaluation approaches have also emerged due to attention given the field by researchers and practitioners. Some of these include CIPP and CIRO (Hogan, 2007). Oliver (2000) also described five types of evaluation: Formative evaluation, Summative evaluation, Illuminative evaluation, Integrative evaluation, and auditive evaluation (evaluation for quality assurance). Compared to FitsPatrick et al's (1983) classifications of evaluation, Oliver's (2000) descriptions can best be considered as broad and general, providing an encompassing description depending on the objective(s) of evaluation. A cursory overview of FitzPatrick et al's (1983) classification is provided in the next paragraph.

The Objective-oriented approach bases on the idea that the purposes, goals, or targets of a project are determined at the start and that the evaluation process should establish whether these have actually been achieved, and if not, why not (Attwell, 2006; Hogan, 2007). The Management-oriented approach serves the needs of decision makers for information by focusing the evaluation products on the needs of managers, policy makers, administrators and practitioners (Attwell, 2006; Hogan, 2007). The Consumer-oriented approach adopts the perspective of the end user of whatever service or product is being provided (Attwell, 2006; Hogan, 2007). Expert-oriented approaches are based on the notion of 'connoisseurship' and criticism and rely heavily on the subjective professional judgement and expert knowledge of the evaluator (Attwell, 2006; Hogan, 2007). The Learner-oriented evaluation approach is aimed at contributing to some form of collective or organisational learning. The models in this approach are based on different theories and types of learning which includes corrective or behavioural learning, cognitive learning and social learning. The outputs and processes of the approach form the inputs of the learning. The Participant-oriented approach takes the needs of project participants as its starting point. The participants in this approach include all stakeholders and potential beneficiaries who may not be direct beneficiaries of the project (Attwell, 2006; Hogan, 2007). Although the intention is not to discuss in detail the various evaluation approaches, in the next paragraph we take a little closer look at the Participant-oriented approach because of its relevance to the study.

Attwell (2006) was of the view that that the Participant-orientated approach usually did not follow a formal plan which was drawn up in advance. The approach rather concentrated on identifying patterns in the data as the evaluation progressed. He argued that different techniques could be used to collect required data and that understanding was generated from observation and bottom-up investigation rather than rational deductive processes. He further opined that the role of the evaluator

was therefore to represent multiple realities and values rather than singular perspectives.

The approach is however not without its criticisms as bureaucrats tend to hate it for its lack of 'objectivity', unpredictability of evaluation outputs, difficulty in costing and control, and the potential for the evaluation to degenerate into chaos and lack of focus (Attwell, 2006). Nonetheless, Performance Evaluation has several benefits for its users. Hogan (2007) contended that programme evaluation is utilized by organisations to periodically assess their processes, procedures and outcomes.

2. Methodology

2.1. The AHP model

Analytical Hierarchy Process (AHP) defined by Wikipedia as an approach to decision making that involves structuring multiple choice criteria into a hierarchy, assessing the relative importance of these criteria, comparing alternatives for each criterion, and determining an overall ranking of the alternatives. The AHP model uses pair-wise comparisons and then computes the weighting factors and evaluates. The method uses a reciprocal decision matrix obtained by pairwise comparisons so that the information is given in a linguistic form. In using the AHP, the decision problem is decomposed into a hierarchy of sub-problems and analysed independently. Comparisons are made between using concrete data about the elements involved. The AHP also takes into consideration human judgements in addition to the underlying information. The AHP converts these evaluations to numerical values that can be processed and compared over the entire range of the problem. A numerical weight or priority is derived for each element of the hierarchy, allowing diverse and often incommensurable elements to be compared to one another in a rational and consistent way. This capability distinguishes the AHP from other decision making techniques.

2.2. Sampling method

The data was collected from e-learning participants selected from 9 Technical Training Institutes, 2 Polytechnics and 1 University across West, East and Southern Africa. In all 28 questionnaires were sent to at least two people from each institution. 11 of the participant from 6 institution responded. The choice of a small sample size will not influence the results because we are using AHP to analyse the data.

3. Results and Analysis

3.1. Consistency Ratio

The consistency ratio gives an indication of how consistent the weightings are. A higher value means less consistent and vice versa. Sambasivan and Fei, (2008) indicated that, a consistency ratio of 0.1 or less represent an acceptable result. Table 3 shows consistency ratios of the various stages of the implementation process which were in the acceptable limits.

Table 3

Consistency Ratio for various stages

Phase	Consistency Ratio
Adoption (AD)	**0.022**
Post Adoption (PA)	**0.057**
Institutionalization (IN)	**0.027**
Overall Implementation	**0.046**

Source: own elaboration.

3.2. Priority Weights

The normalised scores were determined for level one and two which were used to rank the factors in order of importance. At level one, adoption with priority weights 0.4905 was found to be the most importance stage of the implementation. This was followed by Post Adoption (with priority weights of 0.3119) and then institutionalization with priority weights of 0.1976.

At level two the normalised score were obtained for the different factors under each stage of the implementation process. The relative order of importance is also determined for each stage. In the adoption stage the order of importance is as follows: MS (0.4847), SI (0.2268) PG (0.1431), CA (0.0880), and ED (0.0566). Under the Post Adoption stage the order of importance is TS (0.1001), ST (0.1453), EC (0.0546) RA (0.4161) IF (0.2838). The third stage of the process, Institutionalization was found to be MC (0.4232), IC (0.2547), AM (0.1413), SF (0.1163), OS (0.0644). Table 4 captures the priority weights as well as the global priority weights.

Table 4

Global priority weights of sub-factors relative to the goal (level zero)

Ranking Success	Factors	Priority weights	Global Priority weights
1	MS	0.4847	0.1677
2	SI	0.2268	0.1112
3	PG	0.1431	0.0446
4	CA	0.0880	0.0430
5	ED	0.0566	0.0278
6	TS	0.1001	0.0312
7	ST	0.1453	0.0453
8	EC	0.0546	0.0170
9	RA	0.4161	0.1298
10	IF	0.2838	0.0885
11	MC	0.4232	0.0836
12	IC	0.2547	0.0503
13	AM	0.1413	0.0279
14	SF	0.1163	0.0230
15	OS	0.0644	0.0127

Source: own elaboration.

4. Discussion of results

The results of the priority weightings have shown that the most important of the three stages is Adoption. Within this stage, management support and commitment as well as stakeholder involvement have been the two key factors for successful implementation. This is because if the initial idea of e-learning is well accepted by all stakeholders the entire implementation becomes relatively easier. Manage-

ment ability to effectively develop a suitable policy built on right drivers and more importantly communicate the e-learning idea will ensure that the right foundations are built for the next stage. Though the E-learning driver was the least important factor, it has been observed that a right driver could sustain management interest for the entire process. The concept of change will effectively be diffused in to an institution if the adoption stage is well implemented. Conscious effort should be made by management to own the process, with heads actively involved. From the performance chart, it can be observed that management could provide initial support and commitment for the adoption stage, a sustained commitment is the greatest tool for a successful implementation.

The second most important stage is the Post Adoption stage. This is the main implementation stage. From the priority weightings, it can be deduced that the availability of resources is the most important factor at this stage. This factor is closely related to management commitment to the process. The readily availability of resources and the needed infrastructure will see to a smooth implementation of the process. More than 50% of respondents have indicated that their process had halted due to unavailability of resources which includes human resources, financial, and time. Provision of a regular adaptive training to an institution is also seen to be vital at this stage. This is because if the approach to training is not suitable to the institution, the process will suffer. The presence of a technical team to provide training and support is necessary to ensure continuity and improvement of the process.

The third most important stage is institutionalization. Though some authors argue it is the most important stage, the results obtained indicate otherwise. The key factor to guarantee a successful implementation is a continuous commitment of management. The ability to align the e-learning process with management and administrative practice can facilitate the institutionalization process. The centre of this stage is the curriculum integration. Therefore content development must be in line with e-learning for proper institutionalization.

It is important to note the interconnectivity of the factors. Factors including management commitment, communications, training runs through the entire process.

4.1. Performance Excellence chart

A performance excellence chart which shows the different level of the selected factors can be drawn for the given results. This can be used to measure an institution's e-learning performance. Based on the results obtained from the analysis of the AHP model, ten of the factors have been chosen to establish a four level performance excellence chart. These are Management Commitment, Stakeholder involvement, Communication, drivers, Technical support, training, e-learning champions, Resource availability Infrastructure, and Curriculum integration. The choice

of the ten factors was due to the fact that the remaining five are embedded in one of the selected ten. The result of the chart is shown in figure 1.

4.2. Four level performance excellence chart

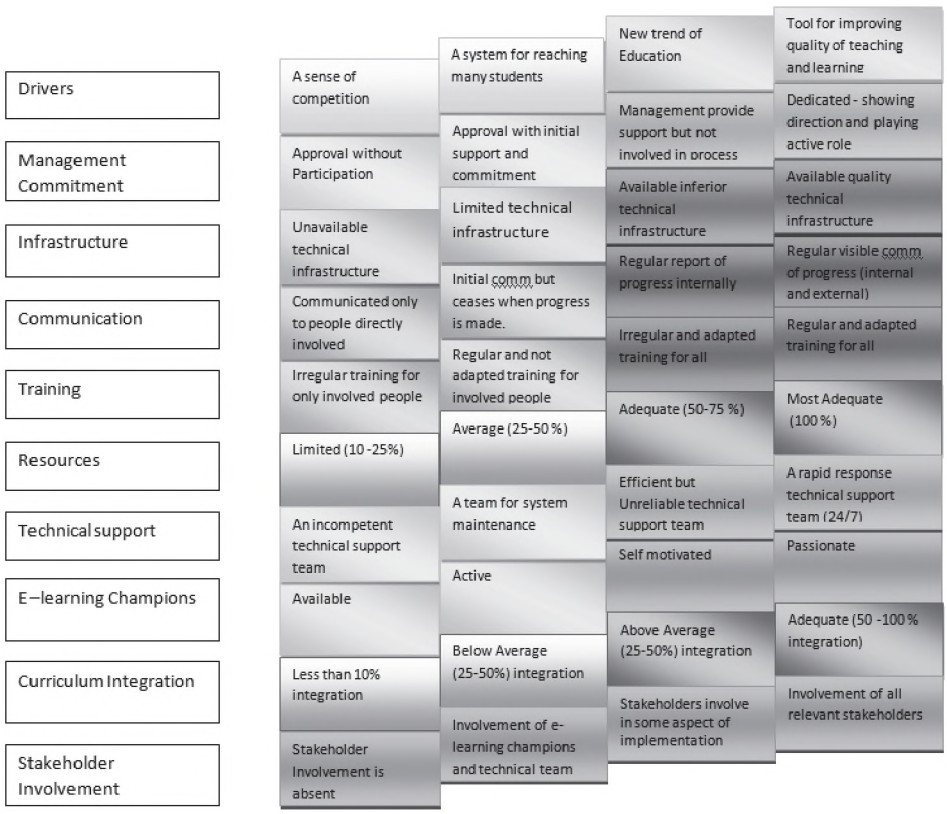

Fig. 1. A four Level Performance Excellence Diagram

Source: own elaboration.

The developed performance chart was used to perform an e-learning gap analysis on one of the institutions. This is captured in the figure 2.

4.3. Gap Analysis

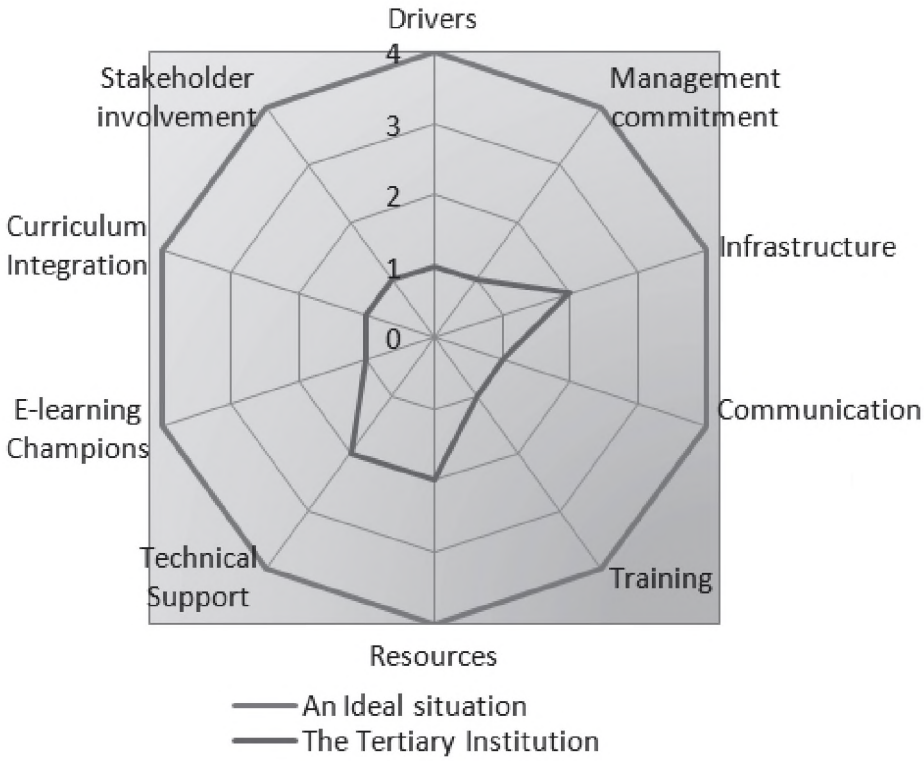

Fig. 2. Gap Analysis for a tertiary Institution

Source: own elaboration.

4.4. Interpretation of Radar Chart (Gap Analysis)

Three inferences can be drawn from the radar chart:

- the area covered by the institution in question compared to the ideal situation on the chart shows how far the institution is from the ideal situation,
- the skewness of the institution's diagram to a factor shows how well the factor is being catered for,
- the regularity or irregularity of the diagram shows which factors are being neglected.

From the radar diagram above, clearly the tertiary institution in question has got a lot of work to do to ensure a better implementation of the E-learning process. The ideal result is the regular decagon. Comparing the area of the regular decagon (the ideal situation) and the irregular one (the case of the tertiary institution), it can be realised that there is significant difference. In totality, this tertiary institution is

scoring 32.5% of the expected performance. May be this is because the chart didn't take into consideration the priority weights of the various factors. That notwithstanding, they are well below societal average.

4.5. Estimating E-Learning Implementation Levels

The Authors have developed a table for estimating the overall e-learning implementation success level. This was established by estimating Scale-Level Point (S-L Point) for all the factors. The S-L point is the product of the priority weight and the coded level as recorded on the performance excellence chart. The sum of the S-L points expressed as a fraction of the ideal total S-L point (8.4428) gives the overall e-learning implementation success level.

Table 3

Summarizing the S-L Point determination

Factors	**Priority Weight (S)**	**Coded Level (1-4)**	**S-L Point (S*L)**
Drivers	0.0566		
Management Support	0.4847		
Infrastructure	0.2838		
Communication	0.088		
Training	0.1453		
Resources	0.4161		
Technical Support	0.1001		
E-learning Champions	0.0546		
Curriculum Integration	0.2547		
Stakeholder Involvement	0.2268		

Source: own elaboration.

The sum of the S-L points can be used to determine the institution's overall e-learning implementation level using the BEE Equation below.

$$\varpi = \frac{\sum SL \text{ points}}{8.4428} \times 100\%$$

Conclusion

Clearly, embedding e-learning in a HEI involves paying attention to distinct implementation phases all of which appears to be closely related. For instance, institutionalizing the e-learning within the HEI requires management support and commitment which needs to be prominently featured throughout the implementa-

tion process in a sustained manner. The analysis in the paper showed the adoption stage to be the most important. This suggests that the successful implementation of e-learning is heavily dependent on the adoption stage. Also the expected change at each stage can be attributed to the management of the each of the identified factors influencing the stage. The performance excellence diagram has also shown the different levels of the factors for e-learning. Though the gap analysis did not take the relative importance of the factors in to consideration it showed how far away institutional efforts at e-learning implementation were from the ideal levels.

Based on the results of the identified the following recommendations have been made for consideration for e-learning implementation:

- institutions implementing e-learning should lay emphasis on the adoption phase,
- a change management approach must be used throughout the implementation process,
- top management support and commitment should run through the entire process.

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PERFORMANCE EVALUATION OF INSTITUTIONAL E-LEARNING IMPLEMENTATION PROCESS: STRATEGY PERSPECTIVES FOR EFFECTIVE INTEGRATION IN TECHNICAL INSTITUTIONS IN AFRICA

Summary

The e-learning implementation efforts of many higher education institutions (HEI) have often failed to achieve the desired expectations of its funders and users. Although performance evaluations could provide some useful insights into the possible causes and solutions of the abysmal performance of implementation efforts, available models focus on the learner's experience, rather than providing a holistic perspective of the entire implementation process. Using a variant of Participant-oriented evaluation approach, this paper presents and utilizes a novel model of the e-learning life-cycle process to evaluate the performance of institutions in their e-learning implementation efforts. The model which is strongly underpinned by the participant-oriented evaluation approach uses the extent of incorporation of important interventions (factors) at each phase of the implementation process (life-cycle) to evaluate the institutional e-learning implementation performance. The model which comprises three distinct phases: adoption, implementation and institutionalization, highlights factors necessary for strategising e-learning implementation efforts and their relative degree of importance using the AHP model. Using data from nine Technical Institutions across Africa, a BEE model has been developed for measuring e-learning implementation levels of HEIs. A four level Excellence Performance Chart (EPC) was developed and used to perform a gap analysis. The results of the gap analysis was then used to determine the scale-level (SL) points of the factors which is then used to determine the overall e-learning implementation level of the institution. The paper concludes with recommendations for continuous improvement in the identified areas.

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